Sowela Technical Community College

Master Course Outline

Course Name: Precalculus Algebra
Course Number: MATH 1120
Lecture contact hours: 45 **Lab contact hours:** 0
Semester Contact Hours: 45 **Semester Credit Hours:** 3 semester hours

Catalog Description: Topics from advanced algebra to include real number properties, solutions of equations and inequalities, relations, functions, graphs, polynomial and rational functions, exponential and logarithmic functions, complex numbers, systems of equations, and the theory of equations.

Prerequisites: "C" or better in MATH 1100 (College Algebra) or a math score of 22 on the Enhanced ACT

Co-requisites: None

Required Textbook and Supplies:

Precalculus, 8th edition, by Michael Sullivan, Prentice Hall, 2008.

All students must have a user-friendly, graphing calculator. The Casio fx-9750 G Plus will be used for classroom demonstrations.

Student Learning Outcomes:

Upon successful completion of this course, the student will be able to

- Demonstrate computational skills necessary for problem solving and mathematical modeling;
- Create, interpret, and revise models to solve problems;
- Collect, organize, and interpret numerical data in various forms;
- Analyze information given in order to draw conclusions and solve problems;
- Demonstrate an understanding of concepts associated with functions including polynomial, rational, exponential and logarithmic functions;
- Find the zeros, graph and analyze properties of specific functions including polynomial, rational, exponential and logarithmic functions;
- Solve equations involving polynomial, rational, exponential and logarithmic expressions;
- Use knowledge of specific functions to solve applied problems;
- Solve linear and nonlinear systems of equations with applications.

Assessment Measures:

- 15% of final course average: 10-12 instructor-designed quizzes
- 60% of final course average: 3-4 instructor-designed exams
- 25% of final course average: Comprehensive, departmental final exam

Expanded Course Outline:

I. Graphs
   a. Graphs of Equations in Two Variables; Intercepts, Symmetry
   b. Lines
   c. Circles

II. Functions and Their Graphs
   a. Functions
   b. The Graph of a Function
   c. Properties of Functions
   d. Library of Functions; Piecewise-defined Functions
   e. Graphing Techniques: Transformations
   f. Mathematical Models: Building Functions

III. Linear and Quadratic Functions
   a. Linear Functions and Their Properties
   b. Building Linear Functions from Data
   c. Quadratic Functions and Their Properties
   d. Quadratic Models; Building Quadratic Functions from Data

IV. Polynomial and Rational Functions
   a. Polynomial Functions and Models
   b. Properties of Rational Functions
   c. The Graph of a Rational Function
   d. Polynomial and Rational Inequalities
   e. The Real Zeros of a Polynomial Function
   f. Complex Zeros; Fundamental Theorem of Algebra

V. Exponential and Logarithmic Functions
   a. Composite Functions
   b. One-to-One Functions; Inverse Functions
   c. Exponential Functions
   d. Logarithmic Functions
   e. Properties of Logarithms
   f. Logarithmic and Exponential Equations

VI. Systems of Equations and Inequalities
   a. Systems of Linear Equations: Substitution and Elimination
   b. Systems of Linear Equations: Matrices
   c. Matrix Algebra
   d. Systems of Nonlinear Equations
   e. Polar Equations of conics (optional)
   f. Plane Curves and Parametric Equations (optional)